

SEQUENCE LISTING

(1) GENERAL INFORMATION:

5

(i) APPLICANT: Tryggvason, Karl  
Kestila, Marjo  
Lenkkeri, Ulla  
Mannikko, Minna

10

(ii) TITLE OF INVENTION: Nephrin Gene and Protein

(iii) NUMBER OF SEQUENCES: 6

15

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: McDonnell Boehnen Hulbert & Berghoff  
(B) STREET: 300 S. Wacker Drive, Suite 3200  
(C) CITY: Chicago  
(D) STATE: IL  
20 (E) COUNTRY: USA  
(F) ZIP: 60606

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(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
25 (D) SOFTWARE: PatentIn Release #1.0, Version #1.30

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(vi) CURRENT APPLICATION DATA:

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(A) APPLICATION NUMBER:  
(B) FILING DATE:  
(C) CLASSIFICATION:

35

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Chao, Mark  
(B) REGISTRATION NUMBER: 37,293  
(C) REFERENCE/DOCKET NUMBER: 97,842

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(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: (312) 913-0001  
(B) TELEFAX: (312) 913-0002

(2) INFORMATION FOR SEQ ID NO:1:

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(i) SEQUENCE CHARACTERISTICS:

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(A) LENGTH: 4285 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: not relevant

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(ii) MOLECULE TYPE: cDNA

5 (ix) FEATURE:  
(A) NAME/KEY: sig\_peptide  
(B) LOCATION: 1..66  
(D) OTHER INFORMATION: /note= "putative signal peptide"

10 (ix) FEATURE:  
(A) NAME/KEY: CDS  
(B) LOCATION: 1..3723

15 (ix) FEATURE:  
(A) NAME/KEY: mat\_peptide  
(B) LOCATION: 67..3723

20 (ix) FEATURE:  
(A) NAME/KEY: misc\_feature  
(B) LOCATION: 121..122  
(D) OTHER INFORMATION: /note= "deletion mutation  
FIN-Major"

25 26 FIN-Minor"  
(ix) FEATURE:  
(A) NAME/KEY: misc\_feature  
(B) LOCATION: 3800..3804  
(D) OTHER INFORMATION: /note= "nonsense mutation in exon

30 (ix) FEATURE:  
(A) NAME/KEY: misc\_feature  
(B) LOCATION: 3178..3258  
(D) OTHER INFORMATION: /note= "putative transmembrane  
domain"

35 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

ATG GCC CTG GGG ACG ACG CTC AGG GCT TCT CTC CTG CTC CTG GGG CTG  
Met Ala Leu Gly Thr Thr Leu Arg Ala Ser Leu Leu Leu Gly Leu  
-22 -20 -15 -10

48

40 CTG ACT GAA GGC CTG GCG CAG TTG GCG ATT CCT GCC TCC GTT CCC CGG  
Leu Thr Glu Gly Leu Ala Gln Leu Ala Ile Pro Ala Ser Val Pro Arg  
-5 1 5 10

96

45 GGC TTC TGG GCC CTG CCT GAA AAC CTG ACG GTG GTG GAG GGG GCC TCA  
Gly Phe Trp Ala Leu Pro Glu Asn Leu Thr Val Val Glu Gly Ala Ser  
15 20 25

144

50 GTG GAG CTG CGT TGT GGG GTC AGC ACC CCT GGC AGT GCG GTG CAA TGG  
Val Glu Leu Arg Cys Gly Val Ser Thr Pro Gly Ser Ala Val Gln Trp  
30 35 40

192

55 GCC AAA GAT GGG CTG CTC CTG GGC CCC GAC CCC AGG ATC CCA GGC TTC  
Ala Lys Asp Gly Leu Leu Leu Gly Pro Asp Pro Arg Ile Pro Gly Phe  
45 50 55

240

CCG AGG TAC CGC CTG GAA GGG GAC CCT GCT AGA GGT GAA TTC CAC CTG  
Pro Arg Tyr Arg Leu Glu Gly Asp Pro Ala Arg Gly Glu Phe His Leu  
288

	60	65	70	
	CAC ATC GAG GCC TGT GAC CTC AGC GAT GAC GCG GAG TAT GAG TGC CAG			336
5	His Ile Glu Ala Cys Asp Leu Ser Asp Asp Ala Glu Tyr Glu Cys Gln			
	75	80	85	90
	GTC GGC CGC TCT GAG ATG GGG CCC GAG CTC GTG TCT CCC AGA GTG ATC			384
	Val Gly Arg Ser Glu Met Gly Pro Glu Leu Val Ser Pro Arg Val Ile			
	95	100	105	
10	CTC TCC ATC CTG GTT CCT CCC AAG CTG CTC CTG CTG ACC CCA GAG GCA			432
	Leu Ser Ile Leu Val Pro Pro Lys Leu Leu Leu Thr Pro Glu Ala			
	110	115	120	
15	GGC ACC ATG GTC ACC TGG GTA GCT GGG CAG GAG TAC GTG GTC AAC TGT			480
	Gly Thr Met Val Thr Trp Val Ala Gly Gln Glu Tyr Val Val Asn Cys			
	125	130	135	
20	GTG TCT GGG GAC GCG AAG CCA GCA CCT GAC ATC ACC ATT CTC CTG AGT			528
	Val Ser Gly Asp Ala Lys Pro Ala Pro Asp Ile Thr Ile Leu Leu Ser			
	140	145	150	
25	GGA CAG ACA ATA TCT GAC ATC TCT GCA AAC GTG AAC GAG GGC TCC CAG			576
	Gly Gln Thr Ile Ser Asp Ile Ser Ala Asn Val Asn Glu Gly Ser Gln			
	155	160	165	170
	CAG AAA CTC TTC ACT GTG GAG GCC ACA GGC AGG GTG ACA CCC CGG AGC			624
	Gln Lys Leu Phe Thr Val Glu Ala Thr Ala Arg Val Thr Pro Arg Ser			
	175	180	185	
30	TCA GAT AAT AGG CAG TTG CTG GTC TGT GAG GCG TCT AGC CCA GCA CTG			672
	Ser Asp Asn Arg Gln Leu Leu Val Cys Glu Ala Ser Ser Pro Ala Leu			
	190	195	200	
35	GAG GCC CCC ATC AAG GCC TCA TTC ACC GTG AAT GTT CTG TTC CCT CCA			720
	Glu Ala Pro Ile Lys Ala Ser Phe Thr Val Asn Val Leu Phe Pro Pro			
	205	210	215	
40	GGA CCC CCT GTC ATC GAG TGG CCA GGC CTG GAT GAG GGG CAC GTG CGG			768
	Gly Pro Pro Val Ile Glu Trp Pro Gly Leu Asp Glu Gly His Val Arg			
	220	225	230	
45	GCA GGA CAG AGC TTG GAG CTG CCG TGC GTG GCC CGA GGG GGT AAT CCC			816
	Ala Gly Gln Ser Leu Glu Leu Pro Cys Val Ala Arg Gly Gly Asn Pro			
	235	240	245	250
	TTA GCC ACA CTG CAG TGG CTG AAG AAT GGC CAG CCG GTG TCC ACA GCG			864
	Leu Ala Thr Leu Gln Trp Leu Lys Asn Gly Gln Pro Val Ser Thr Ala			
	255	260	265	
50	TGG GGC ACA GAG CAC ACC CAG GCG GTG GCC CGC AGT GTG CTG GTG ATG			912
	Trp Gly Thr Glu His Thr Gln Ala Val Ala Arg Ser Val Leu Val Met			
	270	275	280	
55	ACC GTG AGG CCA GAA GAC CAT GGA GCG CAG CTC AGC TGC GAG GCC CAC			960
	Thr Val Arg Pro Glu Asp His Gly Ala Gln Leu Ser Cys Glu Ala His			
	285	290	295	

	AAC AGC GTG TCT GCA GGG ACC CAG GAG CAC GGC ATC ACA CTG CAG GTC	1008
	Asn Ser Val Ser Ala Gly Thr Gln Glu His Gly Ile Thr Leu Gln Val	
	300 305 310	
5	ACC TTT CCC CCT AGT GCC ATT ATT ATC TTG GGA TCT GCA TCC CAG ACT	1056
	Thr Phe Pro Pro Ser Ala Ile Ile Leu Gly Ser Ala Ser Gln Thr	
	315 320 325 330	
10	GAG AAC AAG AAC GTG ACA CTC TCC TGT GTC AGC AAG TCC AGT CGC CCG	1104
	Glu Asn Lys Asn Val Thr Leu Ser Cys Val Ser Lys Ser Ser Arg Pro	
	335 340 345	
15	CGG GTT CTG CTA CGA TGG TGG CTG GGC TGG CGG CAG CTG CTG CCC ATG	1152
	Arg Val Leu Leu Arg Trp Trp Leu Gly Trp Arg Gln Leu Leu Pro Met	
	350 355 360	
20	GAG GAG ACA GTC ATG GAT GGA CTG CAT GGC GGT CAC ATC TCC ATG TCC	1200
	Glu Glu Thr Val Met Asp Gly Leu His Gly Gly His Ile Ser Met Ser	
	365 370 375	
25	AAC CTG ACA TTC CTG GCG CGG CGG GAG GAC AAC GGT CTG ACC CTC ACA	1248
	Asn Leu Thr Phe Leu Ala Arg Arg Glu Asp Asn Gly Leu Thr Leu Thr	
	380 385 390	
30	TGT GAG GCC TTC AGT GAA GCC TTC ACC AAG GAG ACC TTC AAG AAG TCG	1296
	Cys Glu Ala Phe Ser Glu Ala Phe Thr Lys Glu Thr Phe Lys Lys Ser	
	395 400 405 410	
35	CTC ATC CTG AAC GTA AAA TAT CCC GCC CAG AAA CTG TGG ATT GAG GGT	1344
	Leu Ile Leu Asn Val Lys Tyr Pro Ala Gln Lys Leu Trp Ile Glu Gly	
	415 420 425	
40	CCC CCA GAG GGC CAG AAG CTC CGG GCT GGG ACC CGG GTG AGG CTG GTG	1392
	Pro Pro Glu Gly Gln Lys Leu Arg Ala Gly Thr Arg Val Arg Leu Val	
	430 435 440	
45	TGT TTG GCT ATC GGG GGC AAC CCA GAG CCC TCC CTC ATG TGG TAC AAG	1440
	Cys Leu Ala Ile Gly Gly Asn Pro Glu Pro Ser Leu Met Trp Tyr Lys	
	445 450 455	
50	GAC TCG CGC ACC GTG ACC GAG TCG CGG CTG CCG CAG GAG TCG CGG CGC	1488
	Asp Ser Arg Thr Val Thr Glu Ser Arg Leu Pro Gln Glu Ser Arg Arg	
	460 465 470	
55	GTG CAT CTC GGC AGC GTG GAG AAA TCT GGG AGC ACC TTC TCC CGA GAG	1536
	Val His Leu Gly Ser Val Glu Lys Ser Gly Ser Thr Phe Ser Arg Glu	
	475 480 485 490	
60	CTG GTG CTG GTC ACA GGG CCG TCG GAC AAC CAG GCC AAG TTC ACG TGC	1584
	Leu Val Leu Val Thr Gly Pro Ser Asp Asn Gln Ala Lys Phe Thr Cys	
	495 500 505	
65	AAG GCT GGA CAG CTC AGC GCG TCC ACG CAG CTG GCG GTG CAG TTT CCC	1632
	Lys Ala Gly Gln Leu Ser Ala Ser Thr Gln Leu Ala Val Gln Phe Pro	
	510 515 520	

CCA ACT AAC GTG ACG ATC CTG GCC AAC GCA TCC GCA CTG CGC CCG GGA	1680
Pro Thr Asn Val Thr Ile Leu Ala Asn Ala Ser Ala Leu Arg Pro Gly	
525 530 535	
5 GAC GCC TTA AAC TTG ACA TGC GTC AGC GTC AGC AGC AAT CCG CCG GTC	1728
Asp Ala Leu Asn Leu Thr Cys Val Ser Val Ser Asn Pro Pro Val	
540 545 550	
10 AAC TTG TCC TGG GAC AAG GAA GGG GAG AGG CTG GAG GGC GTG GCC GCC	1776
Asn Leu Ser Trp Asp Lys Glu Gly Glu Arg Leu Glu Gly Val Ala Ala	
555 560 565 570	
15 CCA CCC CGG AGA GCC CCA TTC AAA GGC TCC GCC GCC AGG AGC GTC	1824
Pro Pro Arg Arg Ala Pro Phe Lys Gly Ser Ala Ala Ala Arg Ser Val	
575 580 585	
20 CTT CTG CAA GTG TCA TCC CGC GAT CAT GGC CAG CGC GTG ACC TGC CGC	1872
Leu Leu Gln Val Ser Ser Arg Asp His Gly Gln Arg Val Thr Cys Arg	
590 595 600	
25 GCC CAC AGC GCC GAG CTC CGC GAA ACC GTG AGC TCC TTC TAT CGC CTC	1920
Ala His Ser Ala Glu Leu Arg Glu Thr Val Ser Ser Phe Tyr Arg Leu	
605 610 615	
30 AAC GTA CTG TAC CGT CCA GAG TTC CTG GGG GAG CAG GTG CTG GTG GTG	1968
Asn Val Leu Tyr Arg Pro Glu Phe Leu Gly Glu Gln Val Leu Val Val	
620 625 630	
35 ACC GCG GTG GAG CAG GGC GAG GCG TTG CTG CCC GTG TCC GTG TCC GCT	2016
Thr Ala Val Glu Gln Gly Glu Ala Leu Leu Pro Val Ser Val Ser Ala	
635 640 645 650	
40 AAC CCC GCC CCC GAG GCC TTC AAC TGG ACC TTC CGC GGC TAT CGC CTC	2064
Asn Pro Ala Pro Glu Ala Phe Asn Trp Thr Phe Arg Gly Tyr Arg Leu	
655 660 665	
45 AGT CCA GCG GGC CCC CGG CAT CGC ATC CTG TCC AGC GGG GCT CTG	2112
Ser Pro Ala Gly Gly Pro Arg His Arg Ile Leu Ser Ser Gly Ala Leu	
670 675 680	
50 CAT CTG TGG AAT GTG ACC CGC GCG GAC GAC GGC CTC TAT CAG CTG CAC	2160
His Leu Trp Asn Val Thr Arg Ala Asp Asp Gly Leu Tyr Gln Leu His	
685 690 695	
55 TGC CAG AAC TCT GAG GGC ACC GCG GAA GCG CGG CTG CGG CTG GAC GTG	2208
Cys Gln Asn Ser Glu Gly Thr Ala Glu Ala Arg Leu Arg Leu Asp Val	
700 705 710	
50 CAC TAT GCT CCC ACC ATC CGT GCC CTC CAG GAC CCC ACT GAG GTG AAC	2256
His Tyr Ala Pro Thr Ile Arg Ala Leu Gln Asp Pro Thr Glu Val Asn	
715 720 725 730	
55 GTC GGG GGT TCT GTG GAC ATA GTC TGC ACT GTC GAT GCC AAT CCC ATC	2304
Val Gly Gly Ser Val Asp Ile Val Cys Thr Val Asp Ala Asn Pro Ile	
735 740 745	

	CTC CCG GGC ATG TTC AAC TGG GAG AGA CTG GGA GAA GAT GAG GAG GAC Leu Pro Gly Met Phe Asn Trp Glu Arg Leu Gly Glu Asp Glu Glu Asp 750	755	760	2352	
5	CAG AGC CTG GAT GAC ATG GAG AAG ATA TCC AGG GGA CCA ACG GGG CGC Gln Ser Leu Asp Asp Met Glu Lys Ile Ser Arg Gly Pro Thr Gly Arg 765	770	775	2400	
10	CTG CGG ATT CAC CAT GCC AAA CTG GCC CAG GCT GGC GCT TAC CAG TGC Leu Arg Ile His His Ala Lys Leu Ala Gln Ala Gly Ala Tyr Gln Cys 780	785	790	2448	
15	ATT GTG GAC AAT GGG GTG GCG CCT CCA GCA CGA CGG CTG CTC CGT CTT Ile Val Asp Asn Gly Val Ala Pro Pro Ala Arg Arg Leu Leu Arg Leu 795	800	805	810	2496
	GTT GTC AGA TTT GCC CCC CAG GTG GAG CAC CCC ACT CCC CTA ACT AAG Val Val Arg Phe Ala Pro Gln Val Glu His Pro Thr Pro Leu Thr Lys 815	820	825	2544	
20	GTG GCT GCA GCT GGA GAC AGC ACC AGT TCT GCC ACC CTC CAC TGC CGT Val Ala Ala Ala Gly Asp Ser Thr Ser Ala Thr Leu His Cys Arg 830	835	840	2592	
25	GCC CGA GGT GTC CCC AAC ATC GTT TTC ACT TGG ACA AAA AAC GGG GTC Ala Arg Gly Val Pro Asn Ile Val Phe Thr Trp Thr Lys Asn Gly Val 845	850	855	2640	
30	CCT CTG GAT CTC CAA GAT CCC AGG TAC ACG GAG CAC ACA TAC CAC CAG Pro Leu Asp Leu Gln Asp Pro Arg Tyr Thr Glu His Thr Tyr His Gln 860	865	870	2688	
35	GGT GGT GTC CAC AGC AGC CTC CTG ACC ATT GCC AAC GTG TCT GCC GCC Gly Gly Val His Ser Ser Leu Leu Thr Ile Ala Asn Val Ser Ala Ala 875	880	885	890	2736
	CAG GAT TAC GCC CTC TTC ACA TGT ACA GCC ACC AAC GCC CTT GGC TCG Gln Asp Tyr Ala Leu Phe Thr Cys Thr Ala Thr Asn Ala Leu Gly Ser 895	900	905	2784	
40	GAC CAA ACC AAC ATT CAA CTT GTC AGC ATC AGC CGC CCT GAC CCT CCA Asp Gln Thr Asn Ile Gln Leu Val Ser Ile Ser Arg Pro Asp Pro Pro 910	915	920	2832	
45	TCA GGA TTA AAG GTT GTG AGT CTG ACC CCA CAC TCC GTG GGG CTG GAG Ser Gly Leu Lys Val Val Ser Leu Thr Pro His Ser Val Gly Leu Glu 925	930	935	2880	
50	TGG AAG CCT GGC TTT GAT GGG GGC CTG CCA CAG AGG TTC TGC ATC AGG Trp Lys Pro Gly Phe Asp Gly Gly Leu Pro Gln Arg Phe Cys Ile Arg 940	945	950	2928	
55	TAT GAG GCC CTG GGG ACT CCA GGG TTC CAC TAT GTG GAT GTC GTA CCA Tyr Glu Ala Leu Gly Thr Pro Gly Phe His Tyr Val Asp Val Val Pro 955	960	965	970	2976

	CCC CAG GCC ACC ACC TTC ACG CTG ACT GGT CTA CAG CCT TCT ACA AGA Pro Gln Ala Thr Thr Phe Thr Leu Thr Gly Leu Gln Pro Ser Thr Arg 975	980	985	3024	
5	TAC AGG GTC TGG CTG CTG GCC AGT AAT GCC TTG GGG GAC AGT GGA CTG Tyr Arg Val Trp Leu Leu Ala Ser Asn Ala Leu Gly Asp Ser Gly Leu 990	995	1000	3072	
10	GCT GAC AAA GGG ACC CAG CTT CCC ATC ACT ACC CCA GGT CTC CAC CAG Ala Asp Lys Gly Thr Gln Leu Pro Ile Thr Thr Pro Gly Leu His Gln 1005	1010	1015	3120	
15	CCT TCT GGA GAA CCT GAA GAC CAG CTG CCC ACA GAG CCA CCT TCA GGA Pro Ser Gly Glu Pro Glu Asp Gln Leu Pro Thr Glu Pro Pro Ser Gly 1020	1025	1030	3168	
20	CCC TCG GGG CTG CCC CTG CTG CCT GTG CTG TTC GCT CTT GGG GGG CTT Pro Ser Gly Leu Pro Leu Leu Pro Val Leu Phe Ala Leu Gly Gly Leu 1035	1040	1045	1050	3216
25	CTG CTC CTC TCC AAT GCC TCC TGT GTC GGG GGG GTC CTC TGG CAG CGG Leu Leu Leu Ser Asn Ala Ser Cys Val Gly Gly Val Leu Trp Gln Arg 1055	1060	1065	3264	
30	AGA CTC AGG CGT CTT GCT GAG GGC ATC TCA GAG AAG ACA GAG GCA GGG Arg Leu Arg Arg Leu Ala Glu Gly Ile Ser Glu Lys Thr Glu Ala Gly 1070	1075	1080	3312	
35	TCG GAA GAG GAC CGA GTC AGG AAC GAA TAT GAG GAG AGC CAG TGG ACA Ser Glu Glu Asp Arg Val Arg Asn Glu Tyr Glu Glu Ser Gln Trp Thr 1085	1090	1095	3360	
40	GGA GAG CGG GAC ACT CAG AGC TCC ACG GTC AGC ACA ACA GAG GCA GAG Gly Glu Arg Asp Thr Gln Ser Ser Thr Val Ser Thr Thr Glu Ala Glu 1100	1105	1110	3408	
45	CCG TAT TAC CGC TCC CTG AGG GAC TTC AGC CCC CAG CTG CCC CCG ACG Pro Tyr Tyr Arg Ser Leu Arg Asp Phe Ser Pro Gln Leu Pro Pro Thr 1115	1120	1125	1130	3456
50	CAG GAG GAG GTG TCT TAT TCC CGA GGT TTC ACA GGT GAA GAT GAG GAT Gln Glu Glu Val Ser Tyr Ser Arg Gly Phe Thr Gly Glu Asp Glu Asp 1135	1140	1145	3504	
55	ATG GCC TTC CCT GGG CAC TTG TAT GAT GAG GTA GAA AGA ACG TAC CCC Met Ala Phe Pro Gly His Leu Tyr Asp Glu Val Glu Arg Thr Tyr Pro 1150	1155	1160	3552	
	CCG TCT GGA GCC TGG GGA CCC CTC TAC GAT GAA GTG CAG ATG GGA CCC Pro Ser Gly Ala Trp Gly Pro Leu Tyr Asp Glu Val Gln Met Gly Pro 1165	1170	1175	3600	
	TGG GAC CTC CAC TGG CCT GAA GAC ACA TAT CAG GAT CCA AGA GGA ATC Trp Asp Leu His Trp Pro Glu Asp Thr Tyr Gln Asp Pro Arg Gly Ile 1180	1185	1190	3648	

TAT GAC CAG GTG GCC GGA GAC TTG GAC ACT CTG GAA CCC GAT TCT CTG 3696  
Tyr Asp Gln Val Ala Gly Asp Leu Asp Thr Leu Glu Pro Asp Ser Leu  
1195 1200 1205 1210

5 CCC TTC GAG CTG AGG GGA CAT CTG GTG TAAGAGCCCT CTCAACCCCCA 3743  
Pro Phe Glu Leu Arg Gly His Leu Val  
1215

10 TTGTCCTGCA CCTGCAGGAA TTTACACTCC ACTGGTCTCT CTCATTACAG CCTGGGCCGA 3803

GCTGGTTAGG TGAGCTCCAT AAAACCCAAA GGGACTTGGT GTCAGGAGAG GACATGGAGG 3863

GGGCTGAGTG ACAGAGATGG TTCAGCTGGT ACCAGAGTAG AAACAAGGTG CATCCTGGGG 3923

15 TTGGCTTAG AAACTAAACT TCTCCAAAAG GACAGGGCAG ATTGTAAACG TCGTCTCAA 3983

AATGAAATGC TGCCGGGTGC GGTGACTCAC GCCTATAATC CCAGCACTTT GGGAGGCTGA 4043

GGCGGGTGGGA TCACCTGAGG TCAGGAGTTG GAGACCAGCC TGGCCAACAT GGTAAAACTC 4103

20 CATTCTACT AAAATATAA AAAATTAGCC AGGAGTAGTG GCGCATGCCT GTAGTCCCAG 4163

CTACTTGGGA GGCTGATGCA TGAGAATTGC TTGAACCCAG GAGGCGGAGG TTGCAGTGAG 4223

25 CTGAGATCAC GCCACTGCAC TCCAGCCTGG GCGACAGAGC GAGATTCTGT CTCAAAAAT 4283

AA 4285

30 (2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1241 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

40 Met Ala Leu Gly Thr Thr Leu Arg Ala Ser Leu Leu Leu Gly Leu  
-22 -20 -15 -10

45 Leu Thr Glu Gly Leu Ala Gln Leu Ala Ile Pro Ala Ser Val Pro Arg  
-5 1 5 10

Gly Phe Trp Ala Leu Pro Glu Asn Leu Thr Val Val Glu Gly Ala Ser  
15 20 25

50 Val Glu Leu Arg Cys Gly Val Ser Thr Pro Gly Ser Ala Val Gln Trp  
30 35 40

Ala Lys Asp Gly Leu Leu Gly Pro Asp Pro Arg Ile Pro Gly Phe  
45 50 55

55 Pro Arg Tyr Arg Leu Glu Gly Asp Pro Ala Arg Gly Glu Phe His Leu  
60 65 70

His Ile Glu Ala Cys Asp Leu Ser Asp Asp Ala Glu Tyr Glu Cys Gln  
75 80 85 90

5 Val Gly Arg Ser Glu Met Gly Pro Glu Leu Val Ser Pro Arg Val Ile  
95 100 105

Leu Ser Ile Leu Val Pro Pro Lys Leu Leu Leu Thr Pro Glu Ala  
110 115 120

10 Gly Thr Met Val Thr Trp Val Ala Gly Gln Glu Tyr Val Val Asn Cys  
125 130 135

Val Ser Gly Asp Ala Lys Pro Ala Pro Asp Ile Thr Ile Leu Leu Ser  
15 140 145 150

Gly Gln Thr Ile Ser Asp Ile Ser Ala Asn Val Asn Glu Gly Ser Gln  
155 160 165 170

20 Gln Lys Leu Phe Thr Val Glu Ala Thr Ala Arg Val Thr Pro Arg Ser  
175 180 185

Ser Asp Asn Arg Gln Leu Leu Val Cys Glu Ala Ser Ser Pro Ala Leu  
25 190 195 200

Glu Ala Pro Ile Lys Ala Ser Phe Thr Val Asn Val Leu Phe Pro Pro  
205 210 215

Gly Pro Pro Val Ile Glu Trp Pro Gly Leu Asp Glu Gly His Val Arg  
30 220 225 230

Ala Gly Gln Ser Leu Glu Leu Pro Cys Val Ala Arg Gly Gly Asn Pro  
235 240 245 250

35 Leu Ala Thr Leu Gln Trp Leu Lys Asn Gly Gln Pro Val Ser Thr Ala  
255 260 265

Trp Gly Thr Glu His Thr Gln Ala Val Ala Arg Ser Val Leu Val Met  
270 275 280

40 Thr Val Arg Pro Glu Asp His Gly Ala Gln Leu Ser Cys Glu Ala His  
285 290 295

Asn Ser Val Ser Ala Gly Thr Gln Glu His Gly Ile Thr Leu Gln Val  
45 300 305 310

Thr Phe Pro Pro Ser Ala Ile Ile Ile Leu Gly Ser Ala Ser Gln Thr  
315 320 325 330

50 Glu Asn Lys Asn Val Thr Leu Ser Cys Val Ser Lys Ser Ser Arg Pro  
335 340 345

Arg Val Leu Leu Arg Trp Trp Leu Gly Trp Arg Gln Leu Leu Pro Met  
350 355 360

55 Glu Glu Thr Val Met Asp Gly Leu His Gly Gly His Ile Ser Met Ser  
365 370 375

Asn Leu Thr Phe Leu Ala Arg Arg Glu Asp Asn Gly Leu Thr Leu Thr  
380 385 390

5 Cys Glu Ala Phe Ser Glu Ala Phe Thr Lys Glu Thr Phe Lys Lys Ser  
395 400 405 410

Leu Ile Leu Asn Val Lys Tyr Pro Ala Gln Lys Leu Trp Ile Glu Gly  
415 420 425

10 Pro Pro Glu Gly Gln Lys Leu Arg Ala Gly Thr Arg Val Arg Leu Val  
430 435 440

Cys Leu Ala Ile Gly Gly Asn Pro Glu Pro Ser Leu Met Trp Tyr Lys  
15 445 450 455

Asp Ser Arg Thr Val Thr Glu Ser Arg Leu Pro Gln Glu Ser Arg Arg  
460 465 470

20 Val His Leu Gly Ser Val Glu Lys Ser Gly Ser Thr Phe Ser Arg Glu  
475 480 485 490

Leu Val Leu Val Thr Gly Pro Ser Asp Asn Gln Ala Lys Phe Thr Cys  
495 500 505

25 Lys Ala Gly Gln Leu Ser Ala Ser Thr Gln Leu Ala Val Gln Phe Pro  
510 515 520

Pro Thr Asn Val Thr Ile Leu Ala Asn Ala Ser Ala Leu Arg Pro Gly  
30 525 530 535

Asp Ala Leu Asn Leu Thr Cys Val Ser Val Ser Ser Asn Pro Pro Val  
540 545 550

35 Asn Leu Ser Trp Asp Lys Glu Gly Glu Arg Leu Glu Gly Val Ala Ala  
555 560 565 570

Pro Pro Arg Arg Ala Pro Phe Lys Gly Ser Ala Ala Ala Arg Ser Val  
575 580 585

40 Leu Leu Gln Val Ser Ser Arg Asp His Gly Gln Arg Val Thr Cys Arg  
590 595 600

Ala His Ser Ala Glu Leu Arg Glu Thr Val Ser Ser Phe Tyr Arg Leu  
45 605 610 615

Asn Val Leu Tyr Arg Pro Glu Phe Leu Gly Glu Gln Val Leu Val Val  
620 625 630

50 Thr Ala Val Glu Gln Gly Glu Ala Leu Leu Pro Val Ser Val Ser Ala  
635 640 645 650

Asn Pro Ala Pro Glu Ala Phe Asn Trp Thr Phe Arg Gly Tyr Arg Leu  
655 660 665

55 Ser Pro Ala Gly Gly Pro Arg His Arg Ile Leu Ser Ser Gly Ala Leu  
670 675 680

His Leu Trp Asn Val Thr Arg Ala Asp Asp Gly Leu Tyr Gln Leu His  
685 690 695

5 Cys Gln Asn Ser Glu Gly Thr Ala Glu Ala Arg Leu Arg Leu Asp Val  
700 705 710

His Tyr Ala Pro Thr Ile Arg Ala Leu Gln Asp Pro Thr Glu Val Asn  
715 720 725 730

10 Val Gly Gly Ser Val Asp Ile Val Cys Thr Val Asp Ala Asn Pro Ile  
735 740 745

Leu Pro Gly Met Phe Asn Trp Glu Arg Leu Gly Glu Asp Glu Asp  
15 750 755 760

Gln Ser Leu Asp Asp Met Glu Lys Ile Ser Arg Gly Pro Thr Gly Arg  
765 770 775

20 Leu Arg Ile His His Ala Lys Leu Ala Gln Ala Gly Ala Tyr Gln Cys  
780 785 790

Ile Val Asp Asn Gly Val Ala Pro Pro Ala Arg Arg Leu Leu Arg Leu  
795 800 805 810

25 Val Val Arg Phe Ala Pro Gln Val Glu His Pro Thr Pro Leu Thr Lys  
815 820 825

Val Ala Ala Ala Gly Asp Ser Thr Ser Ser Ala Thr Leu His Cys Arg  
30 830 835 840

Ala Arg Gly Val Pro Asn Ile Val Phe Thr Trp Thr Lys Asn Gly Val  
845 850 855

35 Pro Leu Asp Leu Gln Asp Pro Arg Tyr Thr Glu His Thr Tyr His Gln  
860 865 870

Gly Gly Val His Ser Ser Leu Leu Thr Ile Ala Asn Val Ser Ala Ala  
875 880 885 890

40 Gln Asp Tyr Ala Leu Phe Thr Cys Thr Ala Thr Asn Ala Leu Gly Ser  
895 900 905

Asp Gln Thr Asn Ile Gln Leu Val Ser Ile Ser Arg Pro Asp Pro Pro  
45 910 915 920

Ser Gly Leu Lys Val Val Ser Leu Thr Pro His Ser Val Gly Leu Glu  
925 930 935

50 Trp Lys Pro Gly Phe Asp Gly Gly Leu Pro Gln Arg Phe Cys Ile Arg  
940 945 950

Tyr Glu Ala Leu Gly Thr Pro Gly Phe His Tyr Val Asp Val Val Pro  
955 960 965 970

55 Pro Gln Ala Thr Thr Phe Thr Leu Thr Gly Leu Gln Pro Ser Thr Arg  
975 980 985

Tyr Arg Val Trp Leu Leu Ala Ser Asn Ala Leu Gly Asp Ser Gly Leu  
 990 995 1000  
 5 Ala Asp Lys Gly Thr Gln Leu Pro Ile Thr Thr Pro Gly Leu His Gln  
 1005 1010 1015  
 Pro Ser Gly Glu Pro Glu Asp Gln Leu Pro Thr Glu Pro Pro Ser Gly  
 1020 1025 1030  
 10 Pro Ser Gly Leu Pro Leu Leu Pro Val Leu Phe Ala Leu Gly Gly Leu  
 1035 1040 1045 1050  
 Leu Leu Leu Ser Asn Ala Ser Cys Val Gly Gly Val Leu Trp Gln Arg  
 15 1055 1060 1065  
 Arg Leu Arg Arg Leu Ala Glu Gly Ile Ser Glu Lys Thr Glu Ala Gly  
 1070 1075 1080  
 20 Ser Glu Glu Asp Arg Val Arg Asn Glu Tyr Glu Glu Ser Gln Trp Thr  
 1085 1090 1095  
 Gly Glu Arg Asp Thr Gln Ser Ser Thr Val Ser Thr Thr Glu Ala Glu  
 1100 1105 1110  
 25 Pro Tyr Tyr Arg Ser Leu Arg Asp Phe Ser Pro Gln Leu Pro Pro Thr  
 1115 1120 1125 1130  
 Gln Glu Glu Val Ser Tyr Ser Arg Gly Phe Thr Gly Glu Asp Glu Asp  
 30 1135 1140 1145  
 Met Ala Phe Pro Gly His Leu Tyr Asp Glu Val Glu Arg Thr Tyr Pro  
 1150 1155 1160  
 35 Pro Ser Gly Ala Trp Gly Pro Leu Tyr Asp Glu Val Gln Met Gly Pro  
 1165 1170 1175  
 Trp Asp Leu His Trp Pro Glu Asp Thr Tyr Gln Asp Pro Arg Gly Ile  
 1180 1185 1190  
 40 Tyr Asp Gln Val Ala Gly Asp Leu Asp Thr Leu Glu Pro Asp Ser Leu  
 1195 1200 1205 1210  
 Pro Phe Glu Leu Arg Gly His Leu Val  
 45 1215

(2) INFORMATION FOR SEQ ID NO:3:

50 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

55 (ii) MOLECULE TYPE: other nucleic acid

- (A) DESCRIPTION: /desc = "primer exon 2 5'UTR"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

5 GAGAAAGCCA GACAGACGCA G

21

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

10 (A) LENGTH: 17 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

15 (ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer intron 2"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

20 AGCTTCCGCT GGTGGCT

17

(2) INFORMATION FOR SEQ ID NO:5:

25 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

30 (ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer intron 23"

35 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

CTCGGGGAGA CCCACCC

17

(2) INFORMATION FOR SEQ ID NO:6:

40 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 20 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

45 (ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer intron 26"

50

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

55 CCTGATGCTA ACGGCAGGGC

20